Reduction in the cost of INSAT spacecraft

4390. MISS SAROJ KHAPARDE : Will the PRIME MINISTER be pleased to state :

(a) whether indigenous technology development has helped ISRO to reduce the cost of INSAT spacecraft considerably; and

(b) if so, the details thereof?

THE MINISTER OF STATE IN THE PRIME MINISTER'S OFFICE (SHRI BHUVNESH CHATURVEDI) : (a) Yes, Sir.

(b) The indigenously built INSAT-2 satellites cost about Rs. 78.00 crores each. The cost of similar satellites bought from abroad may cost as much as Rs. 300.00 crores. The cost reduction has been possible mainly because of the development of many of the expensive subsystems in India. Also the testing cost of the satellite, which is a high percentage of the total satellite's cost, has been maintained at a low level by building the test facilities in India and testing the satellite using these facilities.

बिहार के नक्शे पर न दर्शाए गये पर्यटन स्थलों का विवरण

4391. **श्री शारदा महन्ती :**
श्री शत्रुघ्न आनन्द पासवान :
श्री सोम पाल :

क्या प्रधान मंत्री यह बताने की कृपा करेंगे कि :

(क) क्या यह सच है कि भारत के महासर्वेक्षक द्वारा बिहार का जो नक्शा छापा गया है उसमें बिहार के सभी पर्यटन स्थलों को नहीं दर्शाया गया है;

(ख) यदि हां, तो तत्संबंधी ब्यौरा क्या है, और इसके क्या कारण है;

(ग) सरकार इस संबंध में क्या कार्यवाही करने का विचार रखती है; और

(घ) यदि नहीं, तो इसके क्या कारण है ?

विज्ञान और प्रौद्योगिकी मंत्रालय, इलेक्ट्रानिकी विभाग और महासागर विकास विभागों और संसदीय कार्य मंत्रालय में राज्य मंत्री (श्री एंगराजन सुधारमंगलम) : (क) बिहार के राज्य मानचित्र, 1974 संस्करण में सभी महत्वपूर्ण शहर/स्थान दिखाये गये हैं। तथापि, मानचित्र के संदर्भों में पर्यटक स्थलों का कोई विशेष उल्लेख नहीं किया गया है।

(ख) बिहार का राज्य मानचित्र उस समय निर्धारित दिनिर्देशों के अनुसार प्रकाशित किया गया था।

(ग) बिहार राज्य मानचित्र का नया संस्करण प्रकाशित किया जा रहा है जिसमें पर्यटक रूचि के महत्वपूर्ण स्थलों को भी दर्शाया जा रहा है। मानचित्र अभी प्रूफ स्तर पर है।

(घ) लागू नहीं होता।

Research laboratories in the country

4392. SHRI KRISHAN LAL SHARMA : Will the PRIME MINISTER be pleased to state :

(a) the number of research laboratories working in the country at present;

(b) how many of these laboratories are able to meet some percentage of their expenditure from their own resources;

(c) whether it is a fact that too much of rules and regulations restrict the working of these laboratories; and

(d) if so, what steps are proposed to be taken to make these laboratories self-supporting ?

THE MINISTER OF STATE IN THE MINISTRY OF SCIENCE AND TECHNOLOGY, DEPARTMENT OF ELECTRONICS AND DEPARTMENT OF OCEAN DEVELOPMENT AND MINISTER OF STATE IN THE MINISTRY OF PARLIAMENTARY AFFAIRS (SHRI P. R. KUMARAMANGALAM) : (a) to (d) Information is being collected and will be laid on the Table of the House.

Imposition of stiff conditions by U.S. on Indo-U.S. co-operation in Space

4393. DR. SANJAYA SINH : Will the PRIME MINISTER be pleased to state :

(a) whether the United States of America has recently set further stiff conditions on Indo-U.S. co-operation in Space; and

(b) if so, what is the reaction of Government thereto ?

THE MINISTER OF STATE IN THE PRIME MINISTER'S OFFICE (SHRI BHUVNESH CHATURVEDI) : (a) No, Sir.

(b) Does not arise.

Incorporation of Antrix Corporation Limited

4394. SHRI KRISHNA KUMAR BIRLA : Will the PRIME MINISTER be pleased to state :

(a) whether Government have incorporated Antrix Corporation Ltd., a company for exploiting the export potential in space market;

(b) if so, what are the objectives and the corporate plans of the said Corporation;

(c) whether Government have secured any business in the space market so far;

(d) if so, the value of exports executed so far; and

(e) the projected business prospects of the Antrix Corporation Ltd.?

THE MINISTER OF STATE IN THE PRIME MINISTER'S OFFICE (SHRI BHUVNESH CHATURVEDI): (a) Yes, Sir. Antrix Corporation Limited is set-up by Government of India under the Administrative control of Department of Space for international/national marketing of Space products and services from India.

(b) The main objectives and the corporate plans of the Corporation are:

(i) Marketing Space products and services in India and abroad.

(ii) Deal with the transfer of technologies developed under the Indian Space Programme to the Indian industries and provide consultancy service.

(iii) Coordinate the Space hardware and software production among ISRO and various Indian industries involved in the Space programme.

(iv) To promote, establish and participate in any collaborative ventures with any company, association or institution for marketing Space hardware.

(c) Yes, Sir. These are as follows:

(i) Study definition of Space Segment System and Assessment of Associated Technologies of LEO Constellation for Hand Held (INMARSAT-P) Services.

(ii) Design, Implementation and Evaluation of Small Omni-directional L/S/UHF Antenna for the INMARSAT-P Hand Held Phone.

(iii) Export of propellant chemicals to LAPAN, Indonesia.

(iv) Providing on-the-job training for Korean Engineers from ETRI, Korea and ARABSAT Engineers.

(v) Benchmaking of FORTRAN Programmes for IBM, Singapore.

(d) US $ 200,000.

(e) The long term plans of the Corporation is to garner atleast 1% of the share of the anticipated world market of US $ 10 billion by 1997.

Damage of engine using cryogenic propellants by explosion

4395. SHRI KAMAL MORARKA: Will the PRIME MINISTER be pleased to state:

(a) whether it is a fact that an explosion had damaged an engine which used cryogenic propellants while testing it at the ISRO facility at Thiruvananthapuram;

(b) if so, the details of the blast;

(c) what are the main reasons for the blast;

(d) whether any enquiry has been conducted into the blast; and

(e) if so, the findings thereof?

THE MINISTER OF STATE IN THE PRIME MINISTER'S OFFICE (SHRI BHUVNESH CHATURVEDI): (a) There was a failure of cryo engine hardware during testing of ISRO's test facilities at Mahendragiri in the last week of June, 1993. This was only the failure of hardware and not explosion. There was no damage either to the facility or personnel.

(b) and (c) Several developmental tests have been conducted successfully on the sub-scale engine of one tonne thrust rating with gaseous Hydrogen and liquid Oxygen. In this particular test, for the first time, liquid Hydrogen and liquid Oxygen were used. Since the injection valves for Liquid Oxygen and Liquid Hydrogen are still under development, the test was conducted with a sequence of long chilling by Liquid Nitrogen through the engine.

The failure was due to partial blocking of nozzle throat by the frozen Liquid Nitrogen used for chilling the lines and the resultant over pressure and consequent ripping open of the engine hardware. Such failures are common during development of cryo engines.

(d) and (e) A failure analysis committee has, after analysing the test results, concluded that there was no problem with the engine and has recommended the use of injection valves for liquid Hydrogen and liquid Oxygen feed lines and Helium for purging in future tests.

Scientists working in Space Programmes

4396. SHRI TINDIVANAM G. VENKATRAMAN:
SHRI J. S. RAJU:

Will the PRIME MINISTER be pleased to